

# GISBox Manual

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## 1 Introduction

Citiviz's **GISBox** is a fully installed, pre-configured and tuned system for Geographical Information System (GIS), data-mining, statistical analysis work and programming. It is based on the **Sabayon Linux** distribution featuring the **MATE** (lightweight) desktop environment.



Figure 1: **GISBox** appliance

## 2 Installed software

The complete list of packages installed on the **GISBox** can be found at <http://citiviz.com/gisbox/packages/1.0>.

## 2.1 Main packages

package	version	description	licence
<b>Geographical Information Systems software</b>			
Postgis	2.0.3	Geographic Objects for PostgreSQL	GPL-2
Grass	6.4.1	OpenSource GIS	GPL-2
QGIS	1.8.0	OpenSource GIS	GPL-2
MapServer	6.0.1	Geographic map server	MIT
MapProxy	1.5.0	WMS tiles caching proxy	Apache-2.0
<b>Statistical and numerical analysis</b>			
QtOctave	0.10.1	Graphical frontend to Octave	GPL-2
Octave	3.6.4	Matlab-like language	GPL-3
RStudio	0.97.336	Graphical frontend to R	AGPL-3
R	3.0.1	Statistical and graphics tool	GPL-3
WEKA	3.6.6	A Java data mining package	GPL-2
<b>Office &amp; productivity</b>			
LaTeXila	2.6.2	Integrated LaTeX environment	GPL-3
LibreOffice	4.0.2.2	full office suite productivity	LGPL-3
Aurora	20.0.1	Unbranded Firefox web browser	GPL-2
<b>General programming</b>			
gvim	7.3.905	graphical vim text editor	vim
xemacs	21.5.31	graphical emacs text editor	GPL-3
pluma	1.6.0	MATE graphical text editor	GPL-2
gcc	4.7.3	C/C++, Fortran, ObjC, ...	GPL-3
perl	5.12.4	Perl programming language	GPL-3
python	2.6.8/2.7.3	Python programming language	PSF-2
Spyder	2.1.13	matlab-like Python IDE	MIT
QT Designer	4.8.4	QT GUI Mockup application	GPL-3
QT Assistant	4.8.4	QT Online documentation	GPL-3
QT Linguist	4.8.4	QT Internationalization tool	GPL-3
<b>Databases</b>			
PostgreSQL	9.1.9	PostgreSQL server	GPL-2
MySQL	5.5.30	MySQL server	GPL-2
sqlite	3.7.15	single-file SQL database	public-domain

## 2.2 QGIS Plugins

plugin	version	description
Coordinate Capture	n/a	Capture coordinates in different CRS
GPS Tools	n/a	Tools for importing GPS data
GRASS	n/a	GRASS layer
GdalTools	1.2.29	Integrates GDAL tools into QGIS
Georeferencer GDAL	n/a	Georeferencing raster using GDAL
Home range estimation w/ R	2.1.8	Kernel NNCH and MCP with R
Load Postgis Raster to QGIS	0.5.4	Load Postgis raster tables
MapServer Export	0.4.3	QGIS project to MapServer map file
OpenLayers Plugin	1.1.0	OpenStreetMap, Google and Bing layers
Plugin Installer	1.2.1	Manage QGIS python plugins
SEXTANTE	1.0.9	Geoprocessing Platform for QGIS
fTools	0.6.2	Vector data analysis and management
manageR	1.1	Interface to R
mmqgis	2012.12.07	QGIS vector layer operation plugins

## 2.3 Python libraries

library	version	description
networkx	1.7	Graph and network library
gdal	1.9.2	Raster geospatial data formats
mapscript	6.0.1	Python bindings for mapserver
shapely	1.2.17	Work with geometric objects
pyshp	1.1.4	Read and write shapefile
geoalchemy	0.7.1	SQLAlchemy extension for spatial databases
sqlalchemy	0.8.0	Python SQL drivers
psycopg	2.5	SQLAlchemy driver for PostgreSQL
numpy	1.7.1	Fast array processing library
wxpython	2.8.12.1	Cross-platform GUI toolkit
pycurl	7.19.0	Python cURL bindings
decorator	3.4.0	Simplified Python decorators
virtualenv	1.9.1	Virtual Python environment builder

## 3 Getting Started

### 3.1 Minimum requirements

- Intel or AMD 64bit CPU;
- Hardware virtualization extensions enabled in the BIOS (VT-x for Intel, AMD-V for AMD)<sup>1</sup>;
- at least 2GB of RAM;
- at least 30GB of free disk space<sup>2</sup>;
- a 64bit operating system.

Please notice that the appliance settings defaults are set to 2 CPUs and 2GB of RAM. If your system has 2 or less CPUs, set the number of assigned CPUs to 1; if you have less than 4GB of RAM, assign at most half of the RAM to the appliance. You can change these settings before importing the appliance into **VirtualBox**<sup>TM</sup> (Section 3.5).

### 3.2 **VirtualBox**<sup>TM</sup> installation

A very good page on the correct installation and configuration of **VirtualBox**<sup>TM</sup> can be found at ENAC-IT site (french only):

<http://enacit.epfl.ch/virtualisation/virtualbox.shtml><sup>3</sup>.

<sup>1</sup>Usually these extensions are disabled by default on most systems. To enable the virtualization extensions, please refer to your computer's manual.

<sup>2</sup>A freshly installed appliance will take about 9GB of disk space. Without using **VirtualBox**<sup>TM</sup> snapshots it can take up to 30GB, if you add data to the appliance. If you use snapshots, it can take more space.

<sup>3</sup>"VirtualBox Extension Pack" is **not** needed by the **GISBox** appliance. However, it does not hurt to install it: it will be useful if you want to plug some USB 2.0 devices directly to the **GISBox**. Refer to Appendix B for a simpler way to transfer data between your system and the **GISBox**.

### 3.3 Obtaining the GISBox appliance

The **GISBox** virtual machine appliance can be downloaded from:

- Citiviz: <http://citiviz.com/gisbox/>, or
- EPFL's ENACSoft: <http://gisbox.epfl.ch> - use this only if you are at EPFL

### 3.4 Opening the appliance

On most operating systems, opening the **GISBox-1.0.ova** file will automatically launch **VirtualBox™** and start the importing process. You should see a dialog like the one in Fig. 2.

If your operating system is unable to automatically open the import dialog, please refer to Appendix A.

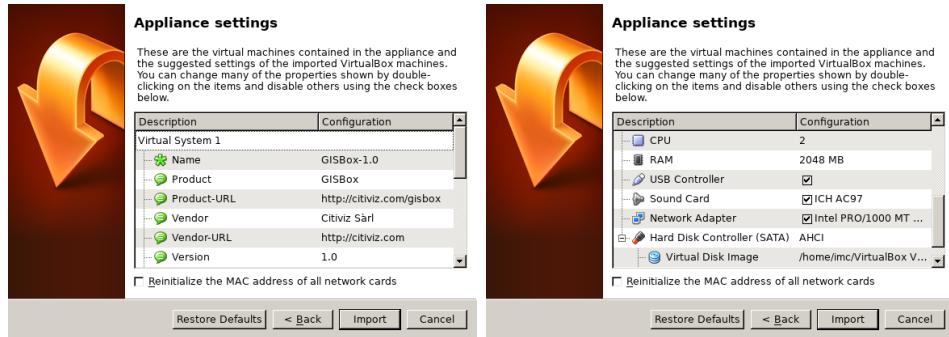


Figure 2: Importing appliance dialog

### 3.5 Importing the appliance

Now you should be looking at a dialog resembling the one in Fig. 2, whether you have opened the appliance automatically or manually. You are now ready to review the details and start the actual importing process.

#### Review the details and configuration of the appliance

Within the import dialog you can change the name of the appliance, the number of CPUs and the RAM assigned to the appliance. The default settings (2 CPUs and 2048MB of RAM) are more than enough. When you are satisfied with the settings, you can click the **Import** button.

## Accept the licences

The **GISBox** appliance is delivered under different licences: The **GISBox** is a collection of free software and is released under the GNU General Public License (GPLv3), with the exception of Citiviz trademarks, logo and additional software. See Appendix E for the licence agreements and the full text of the GPLv3.

A dialog asking you to agree with these conditions will appear (Fig. 3). By clicking the **Agree** button you accept those conditions and will be able to continue.

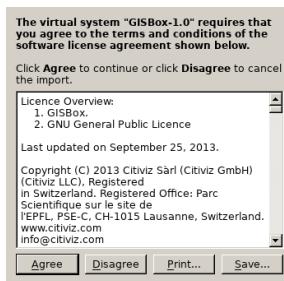


Figure 3: "accept licence" dialog

## Importing process

The importing process will take only a few minutes, you will see a progress bar showing how much time it will take (Fig. 4).



Figure 4: "importing appliance" progress bar

## Appliance is ready

Once the importing process finished, you should see the **GISBox** appliance in the **VirtualBox™** main window, like in Fig. 5.

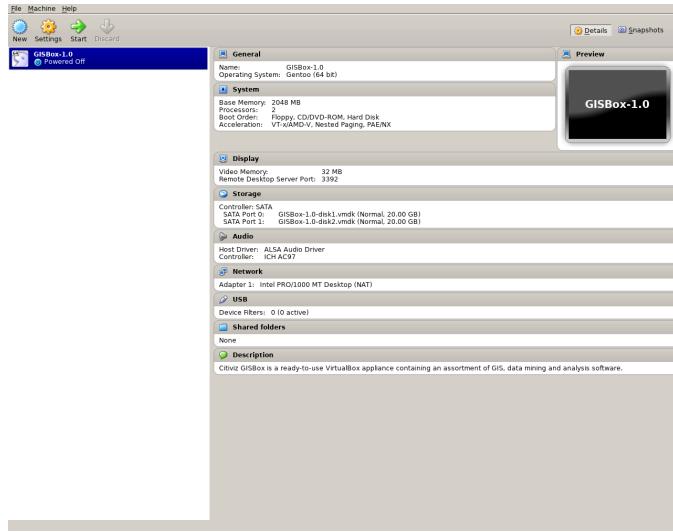


Figure 5: **GISBox** appliance imported

## 4 GISBox usage

### 4.1 Starting the appliance

From the **VirtualBox™** main window, select the **GISBox** appliance and click the **Start** button, as in Fig. 6.

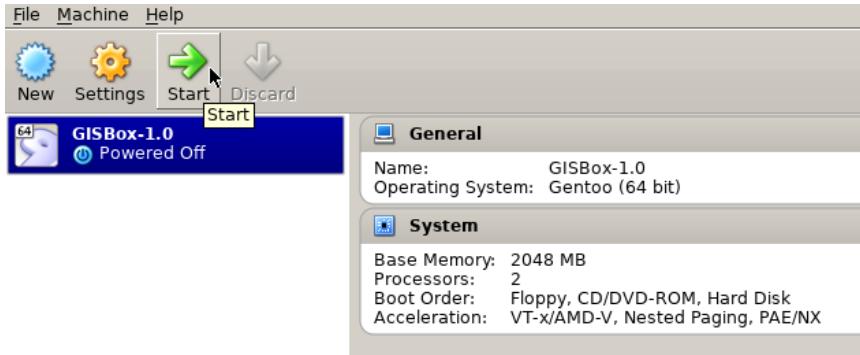


Figure 6: Starting the appliance

A new window showing the virtual machine monitor will appear. Let it boot (Fig. 7). At the end of the boot process the login screen should appear, as in Fig. 8.



Figure 7: **GISBox** booting

## 4.2 Login

These are the credentials to log in:

- login: **user**
- password: **password**

In other words, type **user**, hit *Enter*, type **password** and hit *Enter* again. The login dialog will disappear while the **GISBox** session is starting. A clean **GISBox** desktop looks like the one in Fig. 9.

It is recommended to change the user password, a short "howto" can be found in Appendix D.

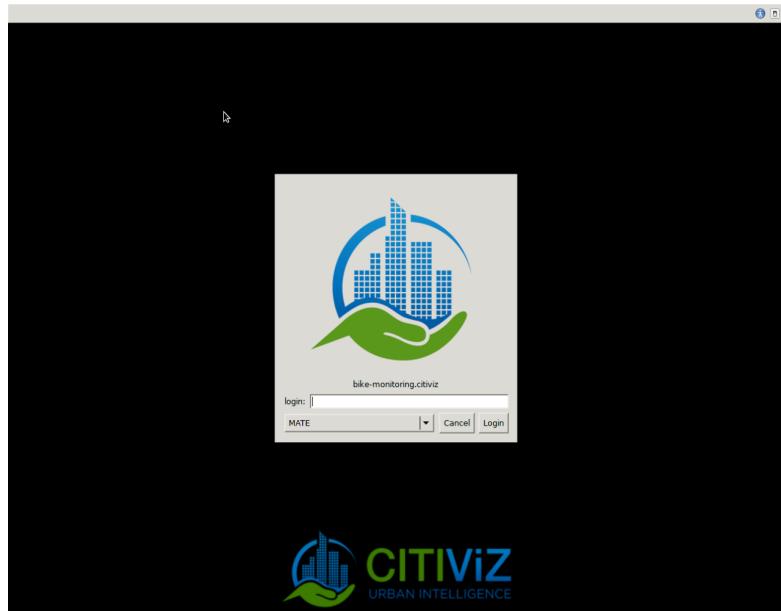


Figure 8: **GISBox** login screen



Figure 9: **GISBox** desktop

## 4.3 The MATE desktop environment

*This part of the documentation will be improved in the future. For the moment, please refer to the project's website and online documentation. <http://mate-desktop.org/>.*

If you want to change the keyboard mapping, there is a short "howto" in Appendix C.

## 4.4 Installed software resources

*This part of the documentation will be improved in the future. For the moment, please refer to the projects' respective websites and online documentation.*

### GIS software

**QGIS** <http://www.qgis.org/>.

**Grass** <http://grass.osgeo.org/>.

**MapServer** <http://mapserver.org/>.

**MapProxy** <http://mapproxy.org/>.

### Statistical and numerical analysis

**QtOctave** <http://developer.berlios.de/projects/qtoctave/>.

**RStudio** <http://www.rstudio.org/>.

**WEKA** <http://www.cs.waikato.ac.nz/~ml/weka/>.

### Office and productivity

**LaTeXila** <https://projects.gnome.org/latexila/>.

**LibreOffice** <http://libreoffice.org/>.

### Programming

**Spyder** <http://spyder-ide.blogspot.com/>.

**gvim** <http://vim.org/>.

**xemacs** <http://www.xemacs.org/>.

QT Designer <http://qt.digia.com>.

#### 4.5 Databases

PostgreSQL <http://www.postgresql.org/>.

PostGIS <http://postgis.net/>.

MySQL <http://www.mysql.com/>.

sqlite <http://www.sqlite.org/>.

## Appendix A

### Open the appliance manually

1. Open **VirtualBox<sup>TM</sup>**;
2. in **VirtualBox<sup>TM</sup>**, open the "importing tool" (Fig. A.1):  
**File > Import Appliance...;**
3. the "importing tool" dialog (Fig. A.2) will show;
4. click the **Open Appliance...** button. A "select appliance" dialog (Fig. A.3) will show;
5. within the "select appliance" dialog, navigate to the appliance file and open it;
6. you are back to the "importing tool" dialog (Fig. A.2), click the **Next >** button;
7. you should now see the "Import appliance" dialog (Fig. 2);
8. Go back to Section 3.5 and follow instructions to complete the import process.

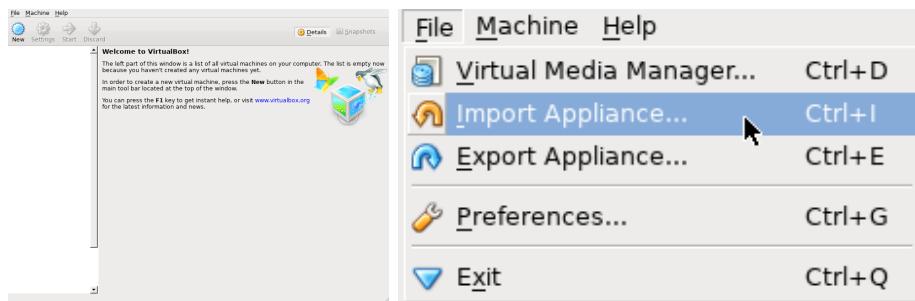


Figure A.1: VirtualBox™ main window and opening the import tool dialog



Figure A.2: Importing tool dialog

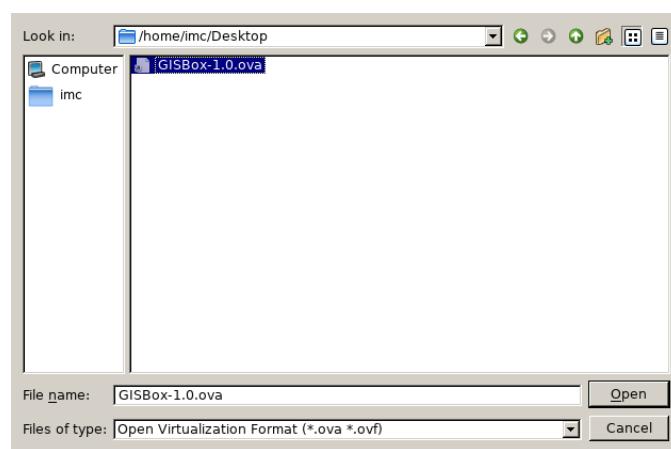


Figure A.3: Selecting appliance dialog

## Appendix B

# Shared Folders

The most straightforward way to exchange data between the host (*your computer*) and the guest (*the **GISBox***) is by using **VirtualBox**<sup>TM</sup>'s Shared Folder feature. **GISBox** comes with two useful icons on the top bar (Fig. B.1), one to make all the configured shared folders available inside the guest, the other to release them (**SharedFolders mounter** on the left, and **SharedFolders unmounter** on the right).



Figure B.1: **GISBox** SharedFolders icons.

All you need to do is setup some shared folders in **VirtualBox**<sup>TM</sup> (Figures B.2 and B.3) and click the **SharedFolders mounter** icon: you will find all your host folders inside the `/home/user/shared/` directory (Fig. B.4).

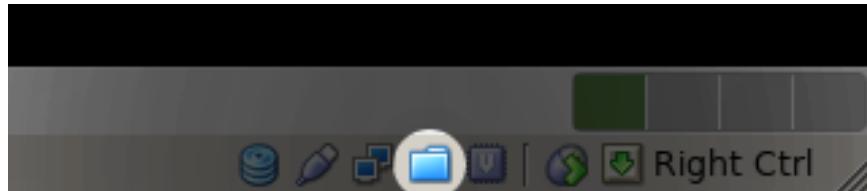


Figure B.2: **VirtualBox**<sup>TM</sup> Shared Folder icon

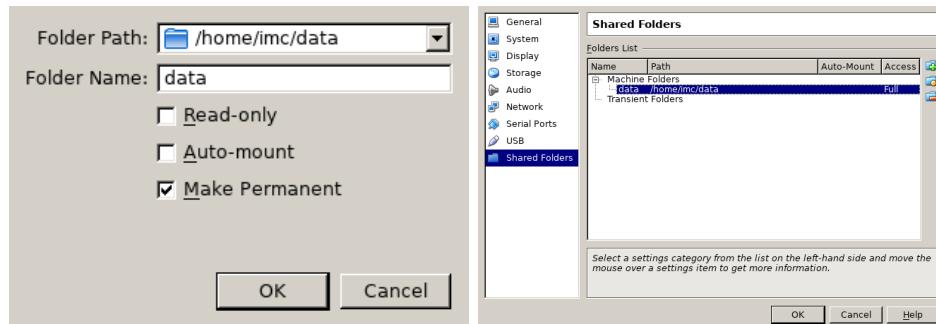


Figure B.3: Adding a VirtualBox™ Shared Folder

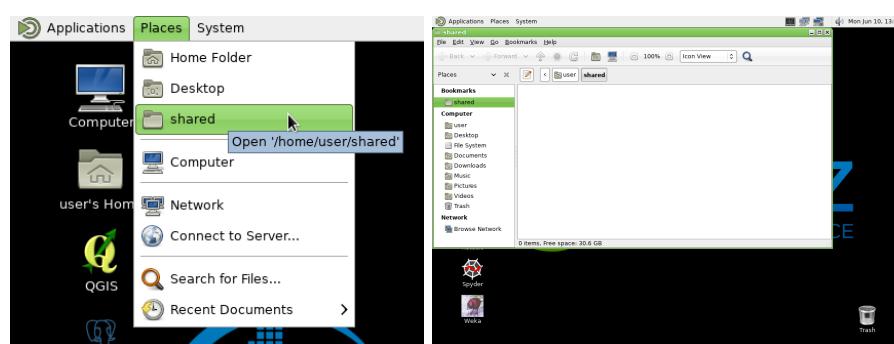


Figure B.4: Accessing the "shared" folder from the "Places" menu

## Appendix C

# Change keyboard layout



Figure C.1: Accessing the keyboard preferences.

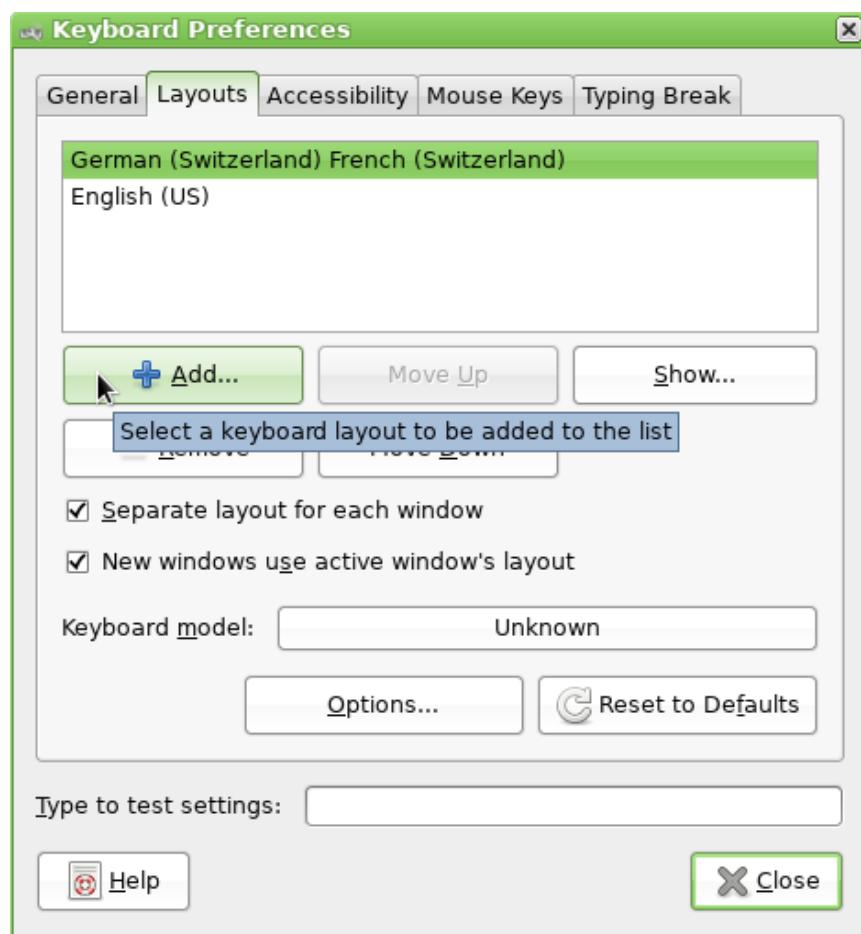


Figure C.2: Keyboard layouts preferences.

## Appendix D

# Change password

To change the user password you can use the graphical tool or the command line.

**Change password graphically** To change the user password graphically, you should access the "About Me" preference dialog. It can be found in the System -> Preferences menu.

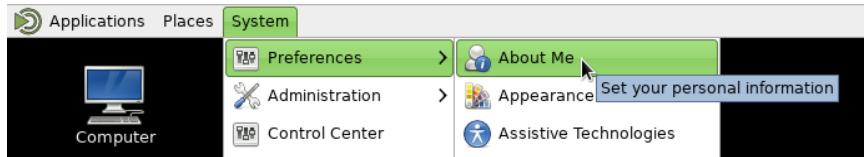


Figure D.1: Accessing the "About Me" preference dialog

The "About Me" preference dialog looks like Fig. D.2. It has a button labeled **Change Password...**, click it and the change password dialog (Fig. D.3) will appear.



Figure D.2: "About Me" preference dialog

As explained in the "Change password" dialog itself, you should first **Authenticate** (by entering the current password and click the **Authenticate**

button), then enter a new password twice and click the **Change password** button on the bottom left.



Figure D.3: "Change password" dialog

**Change password using the command line** Open a Terminal and type `passwd` (Fig. D.4).

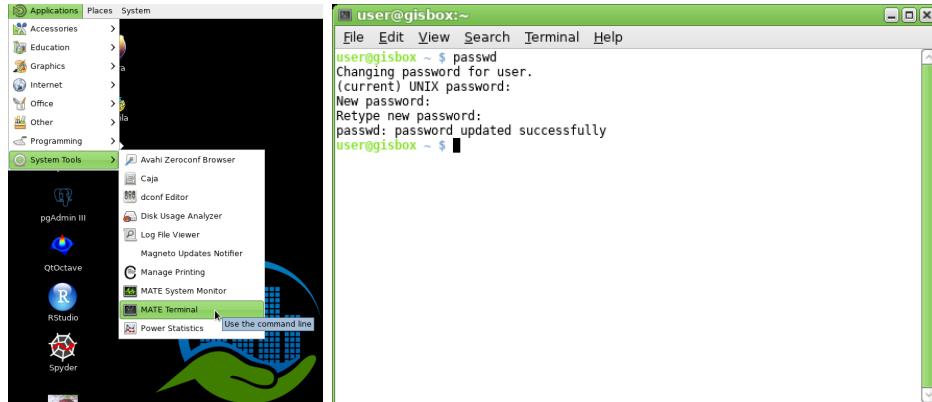


Figure D.4: Opening a terminal and `passwd` command example

Like the graphical way, you should first enter the current password and then the new password twice. Note that you should type the passwords "blindly", since the cursors will not move as you type.

# Appendix E

# Licence Agreements

## 1 Licence Agreement 'GISBox'

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